



## **Beaverdam Swamp Reservoir 2006**

Beaverdam Swamp Reservoir is a 635-acre water supply reservoir for Gloucester County. It was constructed in 1989 and reached full pool level during the winter of 1989-1990. The reservoir and park provide a variety of opportunities for the outdoor enthusiast. There are trails for hiking, biking, and horse riding. You may see deer, turkey, bald eagles as well as a variety of waterfowl. The reservoir serves as an attractive place for anglers to try their luck. The reservoir has plenty of interesting contour and structure. Several creek arms, numerous large points, and an abundance of flooded timber all add to the extreme variability of topography and fish habitat. The use of outboard engines is prohibited on Beaverdam Swamp Reservoir. The use of trolling motors is permitted. There are two boat ramps to Beaverdam Swamp Reservoir. The main ramp is located at the park off Route 616 and the other ramp is off Route 606. The Route 606 ramp offers easier access to the northern areas of the reservoir, but has been specifically designated for annual launch pass holders. Boat and equipment rental, bait, and snacks can be obtained at the main entrance. There is also a fishing pier, picnic facilities, and play areas for children. The park is open 7 days a week and every day of the year except for Christmas and New Year's Day. The concession and main boat ramp can be reached by taking Route 616 from Route 17 (Business), just to the west of Gloucester. For further details, please call the concessionaire at (804) 693-2107.

The Virginia Department of Game and Inland Fisheries conducted an electrofishing survey of Beaverdam Swamp Reservoir on May 3, 2005. The reservoir was last sampled on May 13<sup>th</sup> and 20<sup>th</sup>, 2004. The 2005 sample was concentrated in the 4 historical regions sampled the last few years. The combination of these four sampling runs provides a picture of the present fish assemblage. An 18-foot electrofishing boat equipped with a 16 HP Briggs & Stratton generator was used for the sampling runs. The AC electric current produced by the generator was run through a 680-volt Smith Root electrofishing box and converted to DC current. Six-wired anode droppers were used off bow-mounted booms to place the electric current into the water. The electric current temporarily stuns the fish to the surface to allow for fisheries staff to dip net the fish and place in the live well. The electrofishing box was able to draw and release 6 amps of electricity. The water temperatures varied slightly from 18.1 to 18.4°C. Electrofishing efforts consisted of shocking along the shoreline habitat as close as possible, with the majority of the effort concentrated in the 2 to 4 foot depth range. The four sample runs were each 1,200 seconds long. A total effort of 4,800 seconds (80 minutes) of electrofishing yielded the collection of 9 fish species. This report will concentrate primarily upon the four game fish species of largemouth bass, bluegill, black crappie and redear sunfish. Run 1 was conducted along the southern shoreline of the boat ramp cove. Run 2 was conducted along the western cove adjacent from the park. Run 3 was

conducted along the eastern shore of the upper lake section. Run 4 was conducted along the southern shore of the upper lake section.

Table 1. Total weight, number, and CPUE of fish sampled by electrofishing Beaverdam Swamp Reservoir on May 3, 2005.

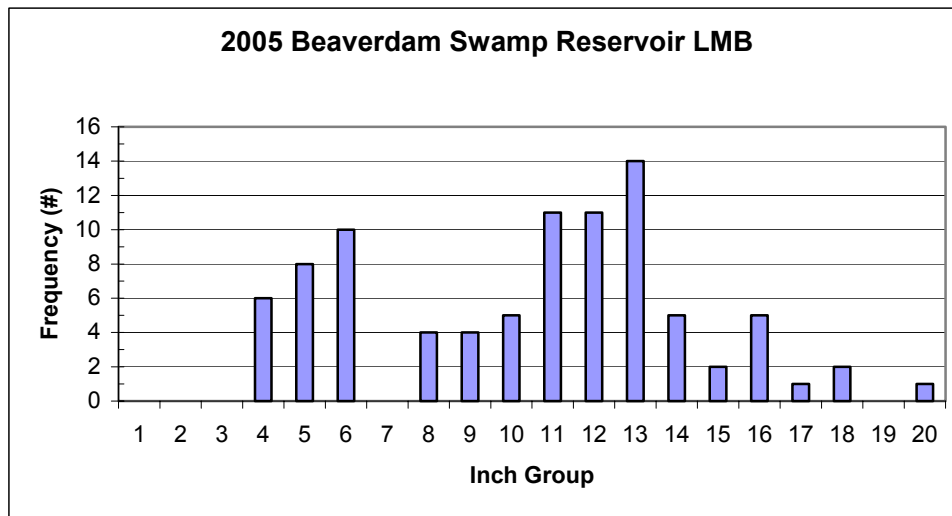
Species	Wt (lbs)	N	Young	CPUE		Total CPUE
				Stock	(#/hr) Quality	
<b>Largemouth Bass</b>	77.64	89	18	15.8	33	66.8
<b>Black Crappie</b>	36.78	111	3	6.7	74.3	83.3
<b>Bluegill</b>		321	134.3	85.5	21	240.8
<b>Redear Sunfish</b>		58	3	33.7	6.8	43.5
<b>Green Sunfish</b>		2	0	0.7	0.8	1.5
<b>Brown Bullhead</b>		8				6
<b>American eel</b>		4				3
<b>Banded Killifish</b>		6				4.5
<b>Golden Shiner</b>		4				3

Table 2. Summary of primary game fish species collected from Beaverdam Swamp Reservoir on May 3, 2005.

Species	# Collected	Largest Length	Average Length
<b>Largemouth Bass</b>	89	20.4"	10.9"
<b>Black Crappie</b>	111	14.5"	8.9"
<b>Bluegill</b>	321	7.64"	3.5"
<b>Redear Sunfish</b>	58	8.7"	5.9"

The largemouth bass population within Beaverdam Swamp Reservoir appears to be reasonably balanced even though no large bass were collected. A total of 89 largemouth bass were collected. The CPUE (Catch Per Unit of Effort) for largemouth bass was 66.8 f/hr and showed an increase from the 2004 sample (CPUE 38.9 f/hr). The 2005 catch rate is slightly lower than most waters within the region. The size distribution of the collected bass can be seen on the enclosed length frequency graph. The overall size structure favors the presence of bass in the 11 to 14 inch range. A total of 41 bass were in this size range. This sizeable proportion of the sample (46%) gives a rough idea of what anglers can expect when fishing the reservoir. The 2004-year class showed satisfactory reproduction with a sizeable distribution of 24 juvenile bass in the 4 to 6 inch range.

Figure 1. Length frequency distribution of largemouth bass collected from Beaverdam Swamp Reservoir on May 3, 2005. (N = 89, CPUE = 66.8)



A total of 59 bass were used for age and growth analysis of the bass population. The otoliths were used to get an accurate reading of length at age. The majority of our sample consisted of bass of age 3 or younger. The bass are reaching an average length of 5.5 inches by age 1, 10.3 inches by age 2, and 13.2 inches by age 3. The limited numbers of bass ages 4 to 9 years of age only offers a rough idea of the growth rates of older fish. The age analysis revealed that the bass older than 4 years of age were not growing that entirely well. Some of the older bass in the 7 to 9 year old range were not very large in size. The largest bass of the sample was 20.4 inches long and weighed only 4.43 pounds. This bass was 8 years old. The two nine-year old bass were 17.76 and 18.35 inches long. No Age-6 bass were sampled. These ages of bass reinforce the fact that it takes a long time to produce a trophy bass in Beaverdam Swamp Reservoir. Anglers are encouraged to carefully release as many large bass as possible. The more 4 to 5 pound bass within the reservoir, the greater the chances of producing 6 to 7 pound bass.

Table 3: Length at age analysis of largemouth bass collected from Beaverdam Swamp Reservoir on May 3, 2005.

Age	Number	Mean Length (in)	Average Weight (lbs)
1	10	5.5	0.07
2	16	10.3	0.52
3	24	13.2	1.15
4	3	15.6	1.99
5	2	15.4	1.85
7	1	18.7	3.51
8	1	20.4	4.43
9	2	18.1	3.17

Fisheries biologists of the past established certain size classifications to describe the fish they collected. It is through these size classifications that population dynamics are analyzed. The size designations are stock, quality, preferred, memorable, and trophy. The PSD (Proportional Stock Density) is the proportion of bass in the population over 8 inches (stock size) that are also at least 12 inches (quality size). A balanced bass/bluegill fishery has a bass PSD value within the 40 – 70 range. With largemouth bass being the most popular game fish in this country, it has been considered that a “preferred” bass is one that is over 15 inches in length. The RSD-P (Relative Stock Density of Preferred bass) is the proportion of bass in the population over 8 inches that are also at least 15 inches. The PSD and RSD-P values represent the distribution of collected fish, but one must take into account the total number of bass collected along with the total of stock-sized bass in the sample.

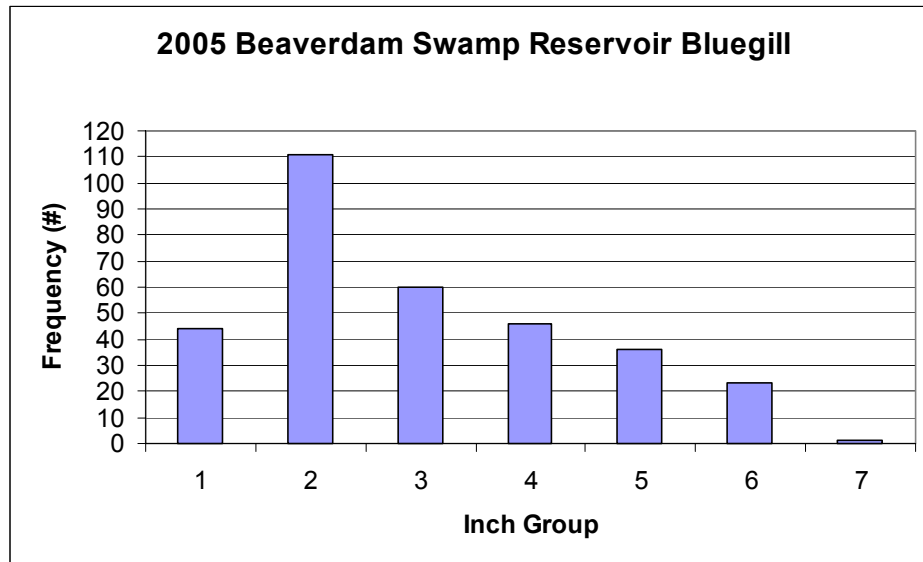
The 2005 sample showed an extremely high PSD value of 68, which is a direct reflection of the 44 bass that were 30 centimeters or longer. The sample had a total of 65 bass that were stock size or larger. This PSD value is toward the high end of a balanced bass/bluegill fishery. This PSD value is much greater than the 2004 PSD value of 32. The 2005 RSD-P value of 17 is a direct reflection of only 11 preferred fish being collected. The RSD-P value is not all that impressive, but it is still an improvement from the 2004 RSD-P value of 5.

Weights were taken on largemouth bass to calculate relative weight values. Relative weight values are an indication of body condition. A value from 95 to 100 represents a fish that is in the healthy range and finding a decent amount of food. The higher the value, the better the condition of the fish in terms of overall body mass. The overall relative weight value was 90. The relative weight values for stock, quality, and preferred bass (>8”, >12”, >15”, >20”) were 90, 90, 94 and 91 respectfully. These relative weight values show that the fish are experiencing slight difficulties in successfully finding enough prey items to forage upon. Body condition factors like relative weight are hard to explain. I would have expected the bass to have higher relative weight values due to the decent number of small bluegill present. The preferred-sized bass appear to be in the best shape as they are most likely foraging upon the 3 to 4 inch bluegill that are present.

The sample revealed the bluegill fishery to be dominated by fish less than 6 inches in length. Electrofishing effort was able to collect 321 bluegills. This CPUE of 240.75 bluegills/hr shows an abundant population exists. The catch rate is much lower than the 2004 sample (370.7 bluegills/hr). This difference is most likely due to the variation of water temperature. The 2004 samples were conducted on May 13<sup>th</sup> and 20<sup>th</sup>. These sampling trips were much later in the season with water temperatures of 27.8°C on the 13<sup>th</sup> and 26.4°C on the 20<sup>th</sup>. The abundance of bluegill and low numbers of bass could be attributed to the warmer water temperatures during the 2004 sample. The 2005 size distribution can be seen on the attached length frequency graph. The average sized bluegill was only 3.5 inches in length. The abundance of small bluegills is present in the 2-inch group with 111 bluegills represented. The PSD for bluegill is the proportion of

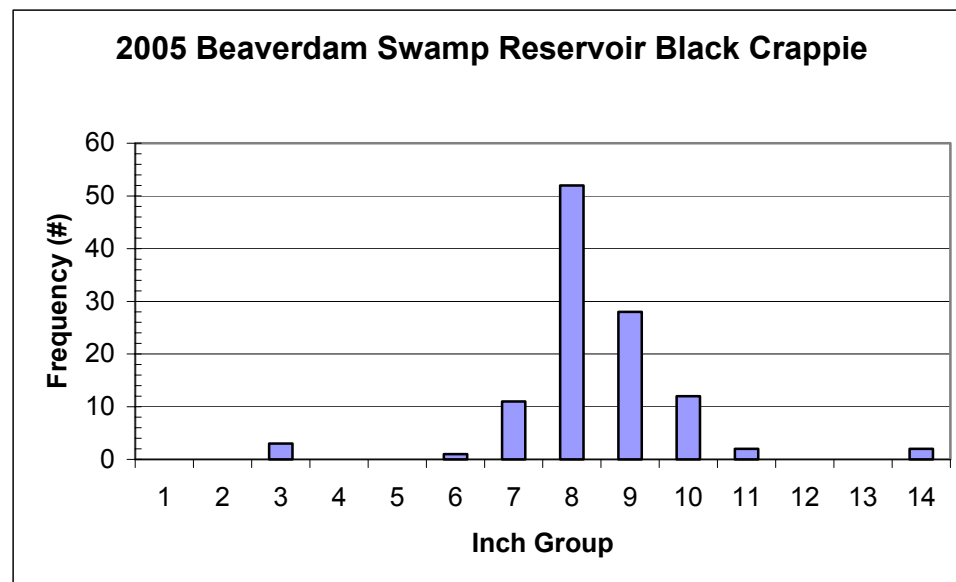
bluegill over 8 cm (stock size) that are also at least 15 cm (quality size). Due to the number of smaller fish, the bluegill PSD was only 20. The collection consisted of 28 quality-sized bluegills in the 6 to 7.64-inch range. The PSD value is at the low end of the 20 to 40 range that would represent a balanced fishery. The total of 142 stock-sized bluegills lowered the PSD value. The largest bluegill measured 7.64 inches in length.

Figure 2. Length frequency distribution of bluegill collected from Beaverdam Swamp Reservoir on May 3, 2005. (N = 321, CPUE = 240.75/hr)



The black crappie population appears to be in decent shape. The sample was able to collect 111 black crappies for a CPUE of 83.25/hr. This catch rate is higher than the 2004 CPUE of 24.5/hr. This difference could be associated to the variable distribution of black crappies. The numbers of any given sample can become elevated if a few schools of crappies are encountered during sampling. This was the case during runs 2 and 3 where a few schools of crappie (N = 49, N = 37) were shocked along shallow flats. These schools helped to expand the total of black crappie collected. The size distribution of the 2005 sample can be seen on the length frequency histogram. The size structure of the 2005 sample showed the majority of the collected crappies (N = 101, 91%) were in the 7.5 to 10.5-inch range. It is hard to determine the full status of the black crappie population. Future trap net sampling will hopefully provide additional data. At first glance, it appears that a few good year classes are driving the population. It also appears that recruitment over the last couple of years has been very poor. Only three crappies in the 3-inch group were collected. The largest black crappie measured 14.5 inches and weighed 1.52 pounds. Taking into account the number of medium-sized black crappies, the average size was 8.9 inches.

Figure 3. Length frequency distribution of black crappies collected from Beaverdam Swamp Reservoir on May 3, 2005. (N = 111, CPUE = 83.25/hr)



The redear sunfish population appears to be in decent shape. A total of 58 redear sunfish were collected for a CPUE of 43.5/hr. This catch rate is much lower than the 2004 sample that collected 134 redear sunfish for a CPUE of 80.1/hr. The warmer water must have triggered the sunfish into an active pre-spawn pattern in 2004. The 2005 size distribution looks decent with the majority of the sample consisting of 5.5 to 7-inch fish. The average size redear sunfish measured 5.9 inches. The largest redear sunfish measured 8.7 inches.

The remaining 5 species of fish collected in low abundance were: brown bullhead, American eel, banded killifish, golden shiners and green sunfish. A bluegill/green sunfish hybrid was also collected. These fish provide some diversity to the fishery and the possibility of exciting an angler from time to time.

The sampling of Beaverdam Swamp Reservoir showed a fishery consisting of 9 species of fish. The primary game fish species are the largemouth bass, bluegill, black crappie and redear sunfish. All of these species were the most abundant in our sample. The reservoir provides some decent bass fishing. Even though our sample did not show it, large bass have been caught from the reservoir. The numbers of largemouth bass citations has dropped over the last few years. The reservoir had very impressive catch rates of citations from 1999 to 2002, with dozens of large bass caught each year. The citation data from 2005 showed that 6 citation-sized bass were reported. An additional electrofishing survey was conducted on June 4, 2005 for a kid's fishing day. This sample collected six bass in the 4 to 6 pound range from the outside edge of a flooded tree line. The May sample revealed a size structure consisting of numerous bass in the 11 to 14 inch range. The bluegill fishery is primarily based on small fish less than 6 inches in length. The electrofishing of black crappies was spotty. The schooling nature of black

crappies makes for a difficult time of finding them. They tend to school in deeper water more than bass and bluegill and make their way to the banks later in the spring. A pair of decent black crappies measuring 14.5 inches each was collected along with a good number of crappies in the 8 to 10 inch range. Future plans for spring trap netting of Beaverdam Swamp Reservoir will provide more insight into the strength of the black crappie population. The reservoir produces some nice redear sunfish in the 6 to 8.7 inch range.